NOTES ICHTYOLOGIQUES

CAPTURE OF THE GIANT NOTOTHENIID FISH *DISSOSTICHUS MAWSONI* IN TERRA NOVA BAY (ANTARCTICA): NOTES ON THE FISHING EQUIPMENT AND THE SPECIMENS CAUGHT.

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RÉSUMÉ. - Trois exemplaires de grande taille (jusqu'à 60 kg) de *Dissostichus mawsoni* Norman, 1937 ont été capturés à Terra Nova Bay (Antarctique) pendant l'Expédition Italienne 1990/91. La zone prospectée est située près de la station italienne de Terra Nova à des profondeurs comprises entre 360 et 380 m. Les auteurs décrivent les engins de pêche utilisés (deux types différents de palangres) et la technique particulière de mise à l'eau qui a permis de minimiser la perte des engins causée par la glace dérivante.

Key-words. - Nototheniidae, *Dissostichus mawsoni*, Antarctica, Terra Nova Bay, Experimental fishing.

Ichthyological surveys were carried out in the frame of the PNRA (National Project for Scientific Research in Antarctica) activities during the 6th Italian expedition in the austral summer 1990/91. To catch *Dissostichus mawsoni*, the presence of which was suspected but not recorded, special gears were used in an area off the Italian Base in Terra Nova Bay, Ross Sea (74° 41' S, 164° 07' E) (Vacchi *et al.*, 1991). Because of the presence of drifting ices, the fishing gears had to be either rapidly set in place or alternatively hauled aboard, in order to minimize the probability of accidental dragging.

The Antarctic toothfish *D. mawsoni* is an engibenthic species endemic of the antarctic seas with circumpolar distribution at latitudes higher than 55° S (Gon and Heemstra, 1990). Extensive oceanic migrations are known for adult specimens (Fischer and Hureau, 1985). Its areal partially overlaps with that of the similar congeneric *D. eleginoides*, exploited in the subantarctic waters by longliner and trawler fleets (Kock, 1992). Since *D. mawsoni* is commonly preyed by Sperm Whales, many informations on its biology and geographic distribution were obtained from the study on the stomach contents of Sperm Whales caught in the Southern Ocean (Yukhov, 1970, 1971). *D. mawsoni* movement patterns in McMurdo Sound were registered by means of ultrasonic transmitters surgically implanted in seven specimens (Ross *et al.*, 1982). Observations of Weddell Seal predation on *D. mawsoni* were made in McMurdo Sound (Calhaem and Christoffel, 1969; Ross *et al.*, 1982; Testa *et al.*, 1985). Data on abundance and ecology of *D. mawsoni* were collected by experimental fishing in McMurdo Sound (Testa *et al.*, 1985).

Material and Methods

The study area stretched between the Campbell Glacier Tongue and Cape Russell (Fig. 1). Fishing operations were carried out from December 19th through February 9th.

The fishing gears used to catch *D. mawsoni* had been designed on the basis of the positive results obtained at McMurdo Sound with vertical longlines sunk through holes drilled in the sea ice (Raymond, 1975) and the operational constraints imposed by the reduced dimensions of the vessel as well as the existence of drifting ices in the sampling area. One of the gears was a vertical longline derived from those used in the Mediterranean to catch large groupers (Nedelec, 1975), whereas the second one was a bottom longline which could be easily set on the deepest grounds because of its reduced size.

Characteristics of fishing gears

Vertical longline: one 20 kg-thrust, reel-shaped signal buoy in plastics storing a 4 mm thick, 800-600 long rope in braided polyammide; 100 m long, 1.5 mm thick nylon monofilament main line supplied with 5 m-spaced swivels for the snoods; the line bore at its ends one 2.5 kg load and one 1 kg thruster respectively; twenty one mm thick steel monofilament snoods 1 m each; hooks number 8/0.

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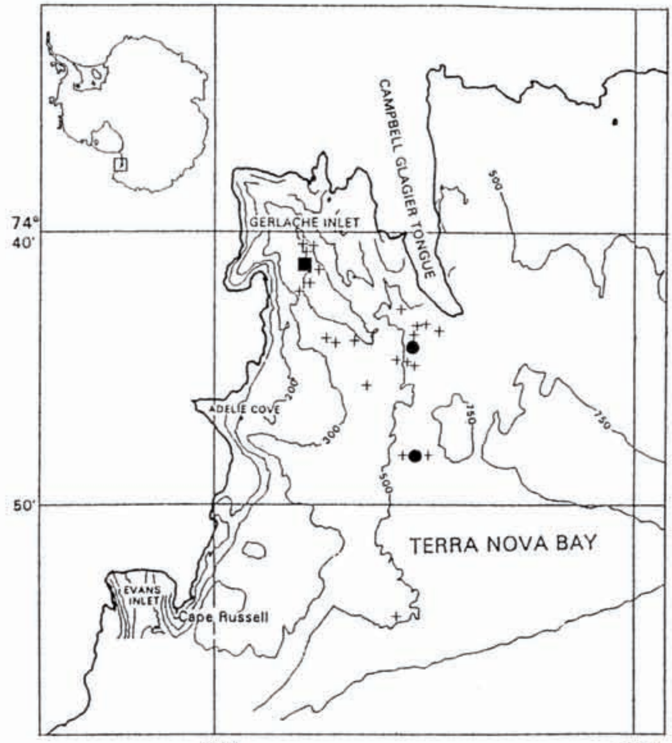

Fig. 1. - Map of the study area.(●) and (■) show catch sites of *Dissostichus mawsoni* by longlines and gill net respectively; (+) indicate other haul locations.

Bottom longline: two signal buoys in plastics as described above; 600 m long, 3 mm thick mainline in braided polyammide bearing 30 m-spaced swivels for the snoods; twenty 1.2 mm thick nylon monofilament snoods 4 m each; hooks number 8/0.

Table I. - Morphometric characters (in % of SL) of two specimens of *Dissostichus mawsoni* from Terra Nova Bay (Antarctica) caught by bottom longline and gill net.

	Gillnet 8 Jan. 1991 (530 m)	**Bottom longline 11 Jan. 1991 (630 m)**
Standard length (mm)	1062	1528
Predorsal length	36.6	31.2
Preanal length	53.3	52.6
Maximum body girth	58.9	68.7
Snout length	27.8	26.8
Base length of first dorsal fin	12.6	17
Base length of second dorsal fin	40	38
Base length of anal fin	36.4	36.6

Table II. - Fishing data of the longline hauls (* = catch of *Dissostichus mawsoni*).

Vertical long line				
Hauls	Date	Time of setting (local hour)	Duration of setting (hours)	Depth (m)
1	19 December 1990	15.15	2.45	550
2	25 December 1990	17.00	18.00	476
3	26 December 1990	11.30	24.30	450
4	27 December 1990	12.30	24.30	380
5*	**29 December 1990**	**16.00**	**19.00**	**655**
6	30 December 1990	13.15	3.45	660
7	2 January 1991	16.10	1.00	610
8	4 January 1991	11.00	7.00	682
9	4 January 1991	19.00	13.30	680
10	8 January 1991	17.15	21.00	553
Bottom long line				
Hauls	Date	Time of setting (local hour)	Duration of setting (hours)	Depth (m)
1	21 December 1990	00.30	3.00	445
2	10 January 1991	15.00	4.00	547
3*	**11 January 1991**	**11.00**	**7.00**	**630**
4	12 January 1991	13.35	1.10	627
5	17 January 1991	12.30	4.00	566
6	18 January 1991	13.30	4.30	571
7	19 January 1991	22.30	4.30	524
8	21 January 1991	11.50	5.10	618
9	1 February 1991	11.30	5.30	662
10	2 February 1991	12.10	5.40	552
11	6 February 1991	12.30	6.30	671
12	7 February 1991	10.00	8.00	620
13	9 February 1991	11.30	5.45	628

Setting operations

Vertical longline: the gear was set by slowly dropping the main line from the boat mantained still in position; once the line had been completely paid out, the signal buoy was thrown outboard. The load clasped to the main line made the gear sink and the rope stored on the buoy fastly roll out.

Bottom longline: the gear was set by throwing the first signal buoy outboard and sailing the boat at a 3/4 knots speed until the entire line had been paid out, then the second buoy was launched into the sea. As in the previous case, the loads clasped to the gear made the longline sink and the ropes roll out.

As a rule, these setting operations lasted no more than 10-15 minutes. Longlines were usually hauled by winch, but due to the light structure of the gears the same operations could be done by hand, if needed. On the whole, 23 hauls at 380-680 m depth range were carried out, 10 by using the vertical longline and 13 by the bottom longline. Informations on these fishing operations are shown in table I.

Catches

Both longlines caught one *D. mawsoni* specimen each. A third specimen was found entangled into a gill net routinely used to sample small-sized fish during the ichthyological survey. All the specimens were captured in the first half of the sampling period (from late December 1990 to mid-January 1991).

Catches were characterized as follows: December 29th: one 50 kg (weight estimated by glance) specimen caught by the vertical longline set at - 655 m, the hooks being baited with squid. During the retrieval operations the specimen at the surface got ride of the hook and escaped before it could be gaffed and hauled aboard; January 8th: one 28 kg, 120 cm TL, specimen caught by a gillnet set on a - 530 m ground; January 11th:captured one specimen weighing 60 kg, TL 167 cm, by the bottom longline on a - 630 m ground. The hooks were again baited with squid. Morphometric characteristics of the retrieved specimens are shown in table II. The smallest specimen is preserved stuffed at the "Italia in Antartide" permanent exhibition of the PNRA in Rome.

Remarks

Our previously described longlines worked rather well in catching *D. mawsoni* specimens. The fishing operations (setting and retrieval of the gears) were fast enough to allow us to work in the open waters crossed by drifting ices, with no presence of pack. The specimens caught in Terra Nova Bay were all found in deep waters and close to the bottom. The two retrieved specimens were females in resting reproductive stage according to a five point maturity scale (Everson, 1977; Anon., 1989). Their gonadosomatic index (GSI) values were respectively 1.33 (large specimen) and 0.29 (small specimen). One specimen of *Paraliparis sp.* was found in the stomach of the smallest fish taken. Remains of two distinct teleosts were also found in the stomach content of other specimen of *D. mawsoni*. Our catch period resulted to be later in the year than one observed at McMurdo Sound for this species. In this area, located more southern of Terra Nova Bay, fishing of *D. mawsoni* peaks from late October to late November (Testa *et al.*, 1985). The negative results registered in the second half of our sampling period should be explained by summer migration of *D. mawsoni* from the Antarctic Continent towards lower latitudes (Yukhov, 1970). A closer cooperation among workers from various Bases of East Antarctica must therefore be sought to get a better insight in the *D. mawsoni* distribution and migrations.

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